AMENDMENTS

In the Specification:

Please replace the paragraph beginning at page 7, line 3 with the following rewritten paragraph:

-- The present invention is a method and apparatus for creating a narrow linewidth hybrid semiconductor laser. According to one embodiment of the present invention, silicon-dioxide and silicone-oxynitride based external feedback elements are used to create the laser. According to another embodiment of the present invention, these feedback elements use Bragg gratings with a resonate optical reflector, which is formed by the coupling, and the periodic variation of the refractive index of two Bragg gratings to a main waveguide trunk (path of the laser beam). According to another embodiment of the present invention, the laser is precisely attached to the waveguide by the use of a flip-chip aligner-bonder. --

A1

Please replace the paragraph beginning at page 7, line 13 with the following rewritten paragraph:

-- According to one or more embodiments of the present invention, the laser has a narrow linewidth range (tens of kHz range) making it accurately tunable to facilitate locking to an ultra-stable cavity. The hybridization technology achieves narrow linewidth in miniature micromachined units. A semiconductor optical gain chip is soldered to a micromachined silicon bench, and the semiconductor optical gain chip is coupled into a silicon-dioxide/silicon-oxinitride/silicon-dioxide (SiO_2/SiON/SiO_2)

A2

A2 cont'd

waveguide terminating in an appropriate feedback element, for example, a Bragg grating that facilitates linewidth reduction. --

Please replace the paragraph beginning at page 10, line 10 with the following rewritten paragraph:

-- The present invention utilizes silicon-dioxide and silicon-oxynitride (SiO_2 – SiON) based passive external feedback elements that are coupled with the active internal elements to create the narrow linewidth hybrid laser. According to one embodiment of the present invention, these external feedback elements are made to closely match the modes of a standard gain chip. At the same time, using the hybridization technique explained below, the present system enables the fabrication of rugged, reliable lasers for large range and space expanses, for example, deep sea or outer space exploration, and communications. Since these external feedback elements do not need gain chips with mode converters that are expensive and not readily available, the present invention cuts on cost and the time to make a rugged, narrow linewidth laser. --

A3

Please replace the paragraph beginning at page 16, line 20 with the following rewritten paragraph:

-- According to another embodiment of the present invention, the semiconductor optical gain chip is coupled into a silicon-dioxide/silicon-oxinitride/silicon-dioxide (SiO_2/SiON/SiO_2) waveguide terminating in an appropriate feedback element, for example, a Bragg grating that facilitates linewidth reduction. The light guides may be deposited using a technique called the Plasma Enhanced Chemical Vapor Deposition. The waveguide layout using this technique is illustrated in Figure 5. The top cladding layer 500 and the lower cladding layer 520 are made of silicon-dioxide, while the core

A4

A4 cont'd

layer 510 is made of silicon-oxinitride. The waveguide mode 530 is placed in the center of the core layer. The $SiO_2/SiON/SiO_2$ waveguide is placed on top of substrate 540. --

Please replace the paragraph beginning at page 23, line 3 with the following rewritten paragraph:

-- The present invention is a method and apparatus for creating a narrow linewidth hybrid semiconductor laser using silicon-dioxide and silicone-oxynitride based external feedback elements. These feedback elements use Bragg gratings formed by periodic variation of the refractive index with a resonate optical reflector. The laser has a narrow linewidth (in the tens of kHz range), which can be accurately tunable to facilitate locking to an ultra-stable cavity. A semiconductor optical gain chip is soldered to a micromachined silicon bench. This semiconductor optical gain chip is coupled into a silicon-dioxide/silicon-oxinitride/silicon-dioxide ($SiO_2/SiON/SiO_2$) waveguide terminating in an appropriate feedback element that facilitates linewidth reduction. In order to suppress the loss and scattering at the $SiO_2/SiON/SiO_2$ interface and due to residual facet reflectance, an antireflection coating is applied. In order to achieve low loss due to mode mismatch, the waveguide modes are tailored to match the gain chip modes. --

A5

Please delete the paragraph starting on page 23, line 10.

In the Claims:

Please amend claims 1, 2, 8, 9, 11 as follows: